

CURRENT LINE

DAR STATEWIDE PROJECT INFORMATION NEWSLETTER

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OCEAN STATE INITIATIVE SURVIVES BUDGET AX

Hawaii's Ocean State Initiative funding has been spared any drastic cuts in the budget passed by the 1998 State Legislature and recently signed into law by Governor Cayetano. The Initiative, which was passed by the 1997 Legislature, provided increased funding for aquatic resources management, primarily in research and enforcement. Although DLNR will be subject to some budget restrictions, Chairperson Michael Wilson has repeatedly indicated that protecting our nearshore marine and freshwater habitats will be a funding priority.

As a result of the Initiative, DAR has been able to start rebuilding its staff. A new aquatic biologist, Dr. William Walsh, has been hired for the Big Island. Based in Kona, Dr. Walsh will focus on West Hawaii's resource issues, such as aquarium fish collecting and reef monitoring. Mr. David Gulko has joined the Oahu staff as an aquatic biologist, concentrating on coral reefs and nearshore habitat improvement. Ms. Athline Clark fills the Division's newly-created planner position. Among her responsibilities will be coordination with local groups for community-based management, outreach, and long-range planning. Two permanent fishery technician positions were also created, one each for Oahu and Hilo. They have been filled by Ms. Corinna Campos and Mr. Darrell Kuamoo, respectively.

The Initiative has made possible a number of research and management

projects currently underway. Among them is the bottomfish recovery plan, which combines new rules with research aimed at eventually creating a stock enhancement program for some bottomfish species. New bottomfish fishing rules went into effect June 1.

Also funded by the Initiative was the DAR-sponsored Coral Reef Monitoring Workshop, which was held June 9-11 at the East-West Center. Coral researchers from around the world were on hand to help Hawaii develop reef monitoring protocols that will help ensure our reefs, which have been described as "at risk," are protected from degradation.

Other Ocean State projects will be described in future issues of Currentline. For now, DAR is breathing a huge sigh of relief that the legislature has recognized the need to continue funding aquatic resource management initiatives. Thanks to all who supported DAR in the 1998 legislative session.

LICENSES, RULES & REGULATIONS

REMINDERS:



Halalu (juvenile akule) Season

Halalu schools start to come inshore during July. It is **unlawful to take akule under 8-1/2 inches with net during July through October**. This regulation was established in 1968 to protect the young akule (halalu) during the peak of their recruitment into the fishery. During the rest of the year (November through

June) halalu may be taken by nets with a minimum mesh size of 1-1/2 inches. Akule may be taken all year round by nets with a minimum mesh size of 1-1/2 inches.

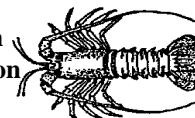
Trout Season



coming up! Open season is from August to September so remember to purchase or renew your freshwater fishing license. Fishing at the Kokee Public Fishing Area is allowed between the hours of 5:30 a.m. and 6:45 p.m. Bag limit is 7 trout per person per day.

Moi & Moi-li'i Season will be closed between **June 1st and August 31st**. These animals spawn during the summer months so let's give them a break to help us increase their numbers.

Spiny Lobster Season Slipper Lobster Season & Kona Crab Season



will be closed between **May 1st thru August 31st**. These animals spawn during this time, so let's give them a chance to breed and multiply.

It's summer time and the Ahi are running! Ahi Season



is open all year round, however, remember that minimum size for sale is 3 pounds.

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NEARSHORE PROJECTS

AKULE FISHERY IN HAWAII



The akule fishery is considered one of the most important of our nearshore fisheries for both commercial and recreational fishermen. Reported commercial landings of akule and hahalalu (juvenile akule, also known as halalu) in the state between 1988 and 1997 averaged 572,782 and 35,004 lbs, respectively, per year. The additional landings made by recreational fishermen is undoubtedly substantial, but unfortunately, an estimate for the recreational landings for akule and halalu is not available. With all things considered, the constant high numbers of landings reported each year on commercial catch reports reflect that the akule/halalu stocks are, so far, stable and can support the current demand on this fishery. However, we should not take this for granted. We are fortunate that the akule/halalu fishery is one of the few that is relatively stable in population. However, the increase in commercial and recreational value raises concerns on the possibility of over-exploiting the existing fishery in Hawaii. Scientists are exploring ways to culture the akule to help maintain the wild stocks.

The akule is a nearshore coastal species that travels in compact schools numbering in the 100's to 1,000's. Mature fish move into shallow water between February and August to spawn. During July through December, large schools of juvenile akule (halalu between 4 to 7 inches, about 4 months old) appear in shallow coastal waters. These halalu schools ultimately join up with the adult akule schools over time. This behavior of schooling and moving inshore makes them highly vulnerable to net operations. (See FISH FACTS on page 4 for more information on akule life history).

In Hawaii, handlines, surround nets, and gill nets are the principle gear used to harvest akule and halalu. Early Hawai-

ians used beach seines called "hukilau" nets to harvest akule schools in bays and small inlets close to shore. Today, nearly all commercial catches are made with surround nets, gill nets, and handline. It is said that the Japanese immigrants introduced the handline fishing method to Hawaii prior to World War I. This method is used primarily in deeper waters at night using a night-light suspended from a skiff to attract plankton, anchovies, and other food organisms which in turn attract the akule schools. The introduction of airplane "fish spotters" following World War II increased the efficiency of the surround net fishery. Over 70% of the akule harvested today by commercial fishermen is landed by nets. Fishing methods used by recreational fishermen vary from pole and line, nets, and handlining from skiffs.

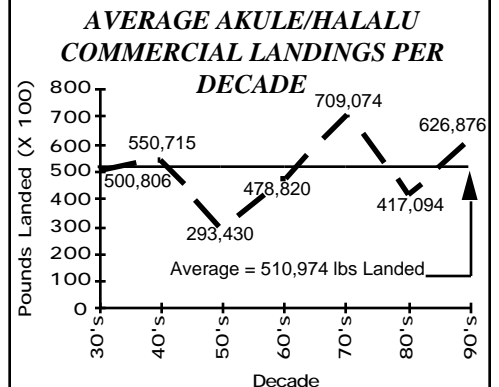
Tagging experiments done by DAR in the late 60's have shown that akule do not migrate between islands and that there is little mixing between populations in the southern, western, and northern parts of Oahu. The majority of the schools tend to remain within a localized area. Between 1965 to 1967, 10,716 hahalalu were tagged by DAR personnel. A total of 880 tags with recovery site information were recovered by net and handline fishermen. Longest days of freedom for a fish was over 600 days. The following table summarizes the migration patterns found from tagged recoveries:

<u>Number Recovered</u>	<u>Tagging Site</u>	<u>Recovery Site</u>
248	Waikiki	Waikiki
1	Waikiki	north of Barbers Pt.
10	Waikiki-Diamond Head	Waikiki-Diamond Head
463	Honolulu Harbor	Honolulu Harbor
81	Ewa Beach	Ewa Beach
3	Ewa Beach	between Barbers Pt. & Nanakuli
1	Ewa Beach	Pokai Bay
40	Haleiwa Bay	Haleiwa Bay
1	Haleiwa Bay	Pokai Bay

<u>Number Recovered</u>	<u>Tagging Site</u>	<u>Recovery Site</u>
1	Haleiwa Bay	Barbers Pt.
23	Pokai Bay	Pokai Bay
1	Pokai Bay	Barbers Pt.
1	Pokai Bay	Honolulu Harbor

Historical catch records show that the akule catch declined from almost 600,000 lbs in 1948 to record lows during the late 1950's. Beginning in 1965 the catches increased dramatically and remained high through 1972. There have been several years of decreased production since then, but the 1976 harvest was again near 1 million pounds. These fluctuations may be due to several factors, such as improved fishing techniques, increased fishing pressure, a natural increase/decrease in available fish stocks or increased/decreased market demand.

The following is a graph showing the yearly average pounds of akule and halalu landed per decade over the last 67 years:



As you can see, the average pounds landed is not much different than what was landed over 30 to 40 years ago. The numbers do reflect a decrease in catch during the 50's and 60's, but as you can see, landings have returned to the average 500,000+ lbs category of previous decades. Even with increased fishing pressure, along with the natural fluctuations of akule stock availability, catch landings indicate that the akule stocks are able to maintain their numbers over time. In addition, the mean sizes of akule reported between 1959 and 1997 have not decreased. The

average weight per fish is now around the 0.6 lb size which means the adults are able to reach spawning size (0.4 lb or 9 inches) before they're caught. Since passing the prohibition in 1968 on the netting of small size akule (from July through October), the bulk of halalu landings are made during November through June with a general increase in the yield of akule by allowing the halalu to grow to larger sizes. This prohibition on netting halalu was established based on recommendations made by commercial fishermen to help maintain the akule and halalu stocks.

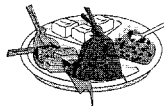
An abundant supply of akule may result in some reduction in prices periodically (resulting in decreased effort), but this does not tend to hold true for long time periods. Generally market demand equals supply. As stated earlier, the akule and halalu fisheries are primarily harvested by nets and handlines. The condition of fish caught by net are less desirable than those caught by handline due to the handling process. This results in a higher price for akule and halalu that are harvested by handline. The following table shows the difference in price for net caught fish versus handline caught fish for the last two years:

AVERAGE WHOLESALE PRICES OF AKULE AND HALALU BY FISHING METHOD FOR 1996 & 1997

Year	Akule	Halalu
1996	\$1.93 (net)	\$1.88 (net)
	\$2.16 (handline)	\$2.09 (handline)
1997	\$1.79 (net)	\$1.53 (net)
	\$2.22 (handline)	\$2.05 (handline)

X-FILES PROJECTS

THINGS THAT GLOW IN THE DARK



Imagine, you are partying all day and into the night drinking beer and eating poke. After sunset as you're STILL drinking beer and talking story with everyone, someone says to you, "Eh brah, check it out --- da poke stay

glowing!" As you turn your head to look toward the food table, you stare in utter disbelief! The expression on your face causes everyone else to look also. All of a sudden, the crowd becomes quiet. There, in the middle of the table, sits a plate of tako poke brightly glowing in the dark. Has this ever happened to you?

Every so often you hear about cases like these where people report that their seafood or seafood product is glowing in the dark. One such report involves a case in Maine where a severe ice storm cut electrical power to a sardine cannery. Workers could not clean up without any power so the fish were left on the conveyor belts for 5 days. One evening, the plant manager came into the plant and found that the fish were glowing so brightly, he could have read a newspaper under its light.

Hawaii also has its fair share of glowing seafood reports. Most recently, Paul Sato of Wailuku, Maui reported that the tako he thawed from the freezer and boiled for New Year's started to glow. There was some concern from the people who had eaten the glowing poke if they would get sick. No one has gotten sick. The people who ate the poke also did not have any side effects. Although it did bother them that the poke was glowing in the dark after the sun went down.

Certain bacteria can cause seafood to glow in the dark. These luminous or glow-in-the-dark bacteria are common in the marine environment. If you've ever been near the ocean at night, you may have seen these bacteria as flashes of light as you splash the water. Or, you may have seen some tiny stone-like shapes glowing in the sand that some people call "moonstones". These marine glow-in-the-dark bacteria are also found on the outer surfaces and in the intestines of marine animals. Some deepwater fishes also have this bacteria in their glow-in-the-dark organs.

These bacteria require salt (as in brine or food preparation) to grow and multiply. When seafoods glow in the dark, it means that many bacteria are present on the product. It doesn't necessarily mean that the seafood is not safe to eat. There

has been no known report of people in Hawaii becoming sick from eating glowing seafood. However, always refrigerate seafood products to minimize the growth of any bacteria and to prevent the product itself from spoiling.

OFFSHORE PROJECTS

FAD PROJECT

FADs were replaced and serviced for Kauai and Oahu counties in June. The deployment cruise for the Big Island and Maui County areas is tentatively scheduled for July 7-11. Work includes light pack service on all on-station FADs and replacement of certain missing FADs. Here is the most recent update of missing FADs:

MISSING FADs (as of July 1, 1998):

FAD	Location	Island
A	South Pt.	Hawai'i
*C	Loa Pt.	Hawai'i
*D	Kumukahi	Hawai'i
*RN	Palima Pt.	Hawai'i
SS	Apua Pt.	Hawai'i
*I	Halona	Kaho'olawe
*Q	Pauwela Pt.	Maui
*HO	Hoolawa Pt.	Maui
M	Hana Bay	Maui
FF	Pukaulua Pt.	Maui
O	Kalaupapa	Moloka'i
Z	Kipukai	Kaua'i
AA	Port Allen	Kaua'i
BB	Molooa	Kaua'i
KK	Waimea	Kaua'i
P	Penguin Bank	O'ahu
U	Kaneohe	O'ahu
CO	Kaena Pt.	O'ahu
HH	Pearl Harbor	O'ahu

**Note: Buoys scheduled for replacement in upcoming Big Island and Maui county cruise.*

For current locations and/or more information, contact Warren Cortez at 848-2939. Also, if you know of any FADs that broke loose, see any light out or have any other comments, please give Warren a call.

FISH FACTS



Selar crumenophthalmus
(Bigeye Scad, Akule, Hahalalu, Halalu)

SIZES

Length: reaches a length of up to 15 inches locally. 4 to 8 inches called "hahalalu" or "halalu"; 2 to 3 inches called "pa`a`a"

Weight: up to 2 1/2 pounds

BREEDING

Sexual Maturity: females are sexually mature at 10 to 12 months of age with fork lengths between 9 to 10 inches; males are sexually mature at 8 to 9 months of age with fork lengths of about 9 inches.

Spawning: from February to August.

LIFESTYLE

Distribution: Circumtropical, from Japan and the Hawaiian Islands marking its northern boundaries, and New Caledonia and Rapa (French Polynesia) marking the southern boundaries.

Habitat: Generally found in mid to surface waters along the coast, or shallow waters near shore. Inhabits waters ranging from shallow shoreline areas out to depths of about 55 fathoms.

Diet: Primarily night feeders; feeds on small fishes such as nehu and squirrelfish; crustaceans such as shrimp, copepods, and crab megalops.

Life Span: 3 years.

RELATED SPECIES

The akule is a member of the Jack Fish Family which includes other species such as ulua and papio, omaka, opelu, lae, and rainbow runner. All are considered good food fishes, supporting valuable commercial and sport fisheries in Hawaii. The akule and hahalalu fisheries are considered the most important of our many inshore fisheries. For the last 10 years, commercial landings of akule and hahalalu have averaged over 500,000 pounds annually.

The following table will give you an idea of how fast these fish grow and how old they are. Please note that these are just ball

park figures and meant only to give you a general idea on the relationship of length, weight, and age.

Length, Weight and Age of Akule/Hahalalu

Fork Length (inches)	Weight (pounds)	Age (months)
2	0	1
4	0.02	2
5	0.16	3
6	0.1	4
7	0.2	5
8	0.26	6
8.3	0.31	7
8.7	0.36	8
9	0.42	9
9.5	0.5	10
9.8	0.56	12 (1yr)
10	0.7	18
12	1	24 (2 yrs)
15	2.5	36 (3 yrs)

The Department of Land and Natural Resources receives financial support under the Federal Aid in Sport Fish Restoration and other federal programs. Under Title VI of the Civil Rights Act of 1964, Section 504 of the Rehabilitation Act of 1973, Title II of the Americans with Disabilities Act of 1990, the Age Discrimination Act of 1975, Title IX of the Education Amendments of 1972, and the laws of the State of Hawaii, the U.S. Department of the Interior and the State of Hawaii prohibit discrimination on the basis of race, color, religion, sex, national origin, age, and disability. If you believe that you have been discriminated against in any program, activity or facility, or if you desire information, please write to: Affirmative Action Officer, Personnel Office, Department of Land and Natural Resources, 1151 Punchbowl Street, Rm. 231, Honolulu, HI 96813, or the U.S. Fish & Wildlife Service, Office for Human Resources, 1849 C Street NW, Room 3058, Washington, D.C. 20240.